

PATENT

REMARKS

Claims 21-32 are pending herein. Claim 21 has been amended herein. Claims 26, 28, and 29 have been rewritten in independent form and, as such, the amendments are non-narrowing amendments. Claim 32 has been cancelled, the subject matter thereof being incorporated into claim 21.

1. The Office Action of January 14, 2003 is incomplete. The Office Action fails to address each and every pending claim, as required by MPEP § 707.07(i). Specifically, the Office Action fails to mention claim 32, newly submitted in an Amendment filed October 14, 2003. Therefore, Applicants respectfully request removal of the finality of the Office Action. However, in the interest of advancing prosecution, Applicants respond below to those issues raised in the Office Action.

2. Claims 21, 22, 24, 25, 27, 30, and 31 were rejected under §103(a) over Hosokawa et al. (EP 1004801A2) in view of Skinner Sr. and Adell. Applicants respectfully traverse this rejection.

The claimed invention is drawn to a method for making a seal device, which may find industrial application in various technology areas including sealing a rotating shaft with respect to a housing. One particular application is the use of such seals in power steering pumps used in automotive applications. The method of claim 21 calls for placing a polymer material onto a metallic substrate and chemically bonding them together with fluoropolymer bonding agent to form a metallic construction, followed by shape forming the metallic construction into a desired shape. Both the metallic substrate and the polymer material layer are bent together thereby forming a contoured portion along which both the metallic substrate and the polymer material layer extend. This feature is shown throughout the various figures of the present application, such as FIG. 4, which illustrates a casing having radial portion 64 and axial portion 62 that are formed by shape forming, wherein the polymer material layer extends along the casing, notably including the contoured portion that is formed by the bend in the casing. The process continues with trimming to form the sealing device.

It appears that the PTO has relied upon Hosokawa for basic structural features of the presently claimed invention, and has acknowledged that a forming process as claimed is not disclosed by Hosokawa. Accordingly, the PTO has looked primarily to Skinner, disclosing a shaping technique in which a seal is formed by co-shaping a substrate and polymer layer together. The PTO has also apparently looked to Adell for similar teaching in the art of co-shaping seals.

Applicants respectfully submit that the references of record fail to disclose or even remotely suggest all features of the presently claimed invention. Foremost, Applicants respectfully submit that the process disclosed by Skinner would not have been incorporated by one of ordinary skill to form the structures disclosed by Hosokawa. More particularly, the structure of Hosokawa cannot be co-shaped. In fact, the structure disclosed by Hosokawa is no more relevant than that structure depicted in FIG. 1 of the present application and admitted as prior art. The cited references do not teach or suggest how to even incorporate the co-shaping technique of Skinner to form the seals as disclosed by Hosokawa. In this regard, turning to the drawings of the present application, the seals according to different embodiments of the present invention are formed by co-forming a polymer material layer and a metallic substrate. Absent Applicants' own teaching, there is no teaching or suggestion of how to even carry out the technique disclosed by Skinner to form any of the structures disclosed by Hosokawa.

Applicants submit that one of ordinary skill in the art would have not relied upon the teachings of Skinner and/or Adell for co-shaping, and applied such teaching to the structures disclosed by Hosokawa, because absent Applicants' own disclosure, one of ordinary skill in the art would consider the structures disclosed by Hosokawa to be exclusive to process techniques in which the individual layers are pre-shaped. Stated alternatively, absent Applicants' own disclosure, one of ordinary skill in the art would not have found it obvious to incorporate the co-shaping technique of Skinner or Adell to form the structures disclosed by Hosokawa, as those structures would have been understood to be incompatible with a co-shaping technique. The additional cited reference Adell fails to bridge the gap between Hosokawa and Skinner. Accordingly, the rejection over Hosokawa in view of Skinner and Adell should be withdrawn for this reason alone.

Moreover, the art of record fails to teach chemical bonding by use of fluoropolymer bonding agents, a particularly important feature of the claimed invention. Skinner, Adell and Hosokawa fail to disclose or even remotely suggest fluoropolymer bonding agents. In particular, Hosokawa discloses fixing components by adhesion, welding or baking, but is silent about specific bonding agents. Skinner discloses Teflon bonded to metal without use of heat. Adell discloses that plastic films can be applied to the metal element with suitable adhesives or by laminating the plastic film to metal with heat or other means, but is also silent about specific bonding agents. As should be clear, the references merely provide general teaching of bonding techniques. In contrast, according to the claimed invention, the use of fluoropolymer bonding agent to effect bonding between the polymer material layer and the metallic substrate, in the context of shaped formed seal devices as claimed, provides important performance advantages. For example, the incorporation particularly of a fluoropolymer bonding agent enables execution of reliable and reproducible shape forming by providing a resilient and robust bond that can survive shape forming as required by the present claims. In addition, applicants have discovered that use of a fluoropolymer bonding agent provides improved seal integrity in practical use, such as a rotating shaft seal. A fluoropolymer agent, let alone the attendant advantages of such a bonding agent in the context of seal devices, are nowhere remotely suggested by the references.

For at least the foregoing reasons, Applicants respectfully submit that the presently claimed invention would not have been obvious over Hosokawa in view of Skinner and Adell. Accordingly, reconsideration and withdrawal of the section 103 rejections are respectfully requested.

3. Claim 23 was rejected under section 103(a) over Hosokawa in view of Skinner Sr. and Adell and in further view of Kondo.

Claim 23 depends from Claim 21. Therefore, for at least the foregoing reasons, Applicants respectfully submit that the presently claimed invention would not have been obvious over Hosokawa in view of Skinner and Adell. Accordingly, reconsideration and withdrawal of the section 103 rejection are respectfully requested.

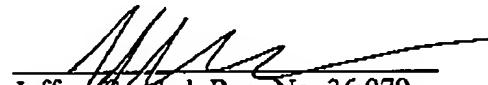
4. Claims 26, 28, and 29 were objected to as being dependent upon a rejected based claim. The Office Action states that Claims 26, 28, and 29 would be allowable if rewritten in independent form. Claims 26, 28, and 29 have been rewritten in independent form.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to telephone Applicants undersigned representative at the number listed below.

Respectfully submitted

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Date


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